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THE ROLE OF THE AMERICAN NEGRO IN THE FIELDS OF SCIENCE.
FINAL REPORT.
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MOST OF THIS REPORT OF A PILOT PROJECT TO GATHER RESOURCE MATERIAL ON AMERICAN NEGRO SCIENTISTS FOR USE IN ELEMENTARY AND SECONDARY SCHOOL CURRICULUMS IS MADE UP OF BRIEF BIOGRAPHIES AND DESCRIPTIOONS OF THE WORK OF 21 NEGRO INVENTORS, BIOLOGISTS, CHEMISTS, AND PHYSICIANS. IT IS FELT THAT MAKING THIS LITTLE-KNOWN MATERIAL AVAILABLE WILL INCREASE THE KNOWLEDGE ABOUT THE NEGRO IN THE UNITED STATES AND THUS IMPROVE RACE RELATIONS. THE MATERIAL WAS GATHERED IN LIBRARY RESEARCH AND FROM PRIMARY SOURCES. AN EXTENSIVE BIBLIOGRAPHY ON THE AMERICAN NEGRO IS INCLUDED. (NH)

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FINAL REPORT

MRS
To: Miss Anna R. Barrett, Project Officer
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and Secondary Education, Bureau of
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Title of Project:

THE ROLE OF THE AMERICAN NEGRO IN THE FIELDS OF SCIENCE

September 5, 1966

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To: Miss Anna E. Barrett, Project Officer
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Washington, D. C. 20202

From: Dr. Louis Haber, Project Director, Pace College,
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Subject: Final Report on Project No. 6-8353
Contract No. 0EC 1-6-068353-1684
Pace College: 41 Park Row, New York, N. Y. 10038

Title of Project: The Role of the American Negro in the
Fields of Science

As was stated in the proposal for this research (see page 6 of proposal) this was to be essentially "a pilot or exploratory study to be done during the summer months, with a view to developing it into a more extensive research project if results appear to be fruitful". This statement is expanded upon on page 9 of the proposal where it is stated, "If called for, an application for an extended study will be made ...... under the 'Basic and Applied Research Program'". I can state, at this time, that I have found rich possibilities for very rewarding research work in this area that I have been able to only "tap" during these summer months. I feel that years of research could be done in the area of the role of the American Negro in the fields of science - with extremely fruitful results! I plan to submit an application for this purpose under the Basic and Applied Research Program of the Office of Education.

I would point out that it has been somewhat frustrating to try to gather a lot of this material during the summer months when important personnel, key scientists, etc. are away on their vacation and therefore not available to the researcher.

The main objective of this pilot study was to secure and classify resource materials dealing with the contributions of the American Negro in the fields of science, and the role the Negro has played in the development of scientific progress in the United States. These resource materials, found in the body of this report, are available herewith to all science teachers anywhere in the United States and can be incorporated into curriculum units in elementary and secondary schools.

A further objective of this study was to improve the image of the Negro in the United States by showing his contributions to the fields of Science thereby developing an increased awareness of the role the Negro has played in expanding the scientific resources of this country. This, in turn, achieves a better understanding of the role of the Negro in our history and culture, so important to intergroup harmony and to the production of leaders capable of maintaining and securing those rights and liberties which all Americans cherish.

More and more, science teachers are asking for resource material on the Negro in science. Such material, at present, is either not readily available or very difficult to locate. It is hoped that the material in this report will begin to supply this kind of resource material. Unfortunately, science texts and other science books commonly used in our schools contain very little information dealing with the contributions of the American Negro to the fields of science. While frequent references are made to George Washington Carver and his work, the lack of references to other Negro scientists would make it appear that they do not exist! Important and significant contributions to science made by such outstanding Negroes as Benjamin Banneker, Dr. Charles

R. Drew, Dr. Percy L. Julian, Dr. Ernest E. Just, and a host of others are unfortunately unknown to the average science teacher and therefore to the science student.

In his book on the Negro in the United States[1], Dr. Frazier, Professor of Sociology at Howard University, makes the following statement, "The pattern of race relations has tended in other ways to distort the real significance of the contributions of Negro scientists and scholars. For example, there is little publicity given to the achievements of Just in the field of biology, and Charles H. Turner, an outstanding entomologist, while George W. Carver has been seized upon as a symbol of the intellectual achievements of Negroes. Carver was connected with Tuskegee Institute, which has represented in the public mind the 'right' type of education for Negroes. In addition, Carver's physical appearance together with the publicity concerning his great humility made a special appeal to the prejudices of the whites. In fact, any Negro who happens to fit into the white man's conception of the Negro or plays a desirable role in 'interracial politics' may be built up into an intellectual giant."

Procedures Used

1. Library Research: A most prolific source of information was the branch of the New York Public Library located in the Harlem area of New York City and known as the Schomberg Collection. This library specializes in Negro affairs and proved to be invaluable in terms of type and amount of material. The Moorland Collection at Howard University was also utilized

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[1] Frazier, E. Franklin, The Negro in the United States, rev. ed., Macmillan Company, New York, 1957

although it did not prove to be as fruitful as the Schomberg Collection Library in New York City. The Library of Congress in Washington, D. C. was excellent in terms of manuscripts as well as books and periodicals on the subject. Several trips were made to the Library of Congress and a special pass to the stacks proved to be extremely helpful indeed. Also utilized were the libraries at Morgan State College, Pace College, Columbia University, and New York University.

2. Primary sources of information:

The National Archives in Washington, D. C. proved to be very helpful in securing original materials such as letters, documents, etc. concerning Carver, Dr. Daniel H. Williams, etc. In the Documents Section of the Library of Congress, I cam across a handwritten letter from Thomas Jefferson to Benjamin Banneker.

I spent several hours interviewing the widow of the late Dr. Charles R. Drew, of blood bank fame. I discovered that she lived in Washington, D. C. and was able to arrange to interview her. She was extremely helpful in filling in and in correcting facts concerning Dr. Drew's life and work. I was also able to interview a close friend of Dr. Drew - Miss Gertrude P. McBrown who has been associated with the National Association for the Study of Negro Life and History for the past thirty years and who was able to tell me a good deal of Dr. Drew and his family.

I was also able to make personal contact with Dr. Percy L. Julian, the outstanding organic chemist who is presently heading his own laboratories in Chicago in medical research.

At Howard University and at Morgan State College, however, I was unable to contact such scientists as Dr. Cobb, Dr. Branson, and many others whom I had planned to interview. They were all away for the summer and were not expected back until the opening of school in September.

Through diligent research, and some luck, I was able to locate the granddaughter of Lewis Latimer, the scientist who worked with Thomas Edison in the field of electricity. Her name is Miss Winifred Norman and she has a good deal of material about Latimer in the form of letters, pictures, etc., but for some reason is reluctant to allow other people to see this material. She had promised to donate it to the Schomberg Collection Library but has not done so to date.

3. Negro Organizations:

Contact was made, by telephone and in person, with the following Negro organizations:

National Association for the Advancement of Colored People
20 West 40 Street, New York, N. Y.

Congress of Racial Equality, 38 Park Row, New York, N. Y.

National Urban League, 14 East 48 Street, New York, N. Y.

The American Society of African Culture, 15 East 40 Street,
New York, N. Y.

The Association for the Study of Negro Life and History,
1538 Ninth Street, N.W., Washington, D. C.

Unfortunately, little if any information was forthcoming from these sources concerning the role of the American Negro in the fields of science. Each organization expressed great interest in what I was doing and asked to be informed of the results of my research, but no real help was available from any of them. Some even expressed mild surprise that I should seek such information from them.

The main body of this Final Report will be devoted to the incorporation of the resource material gathered by this researcher. This material will be classified into these four sections:

I. Inventors
II. Biologists
III. Chemists
IV. Physicians

The names of Negro scientists in each of these four sections or categories are representative and therefore by no means are they meant to be exhaustive or all inclusive. As has been previously stated, this is only a pilot or exploratory study and further research should reveal many, many more names to be added to these and other science categories.

I. INVENTORS:

In the early 1900's, a leading newspaper in Richmond, Va. made the statement that of the many thousands of patents annually granted by our government to the inventors of our country, "not a single patent had ever been granted to a colored man".[2] Yet, at that moment, there was in the Library of Congress a book of nearly 500 pages containing a list of nearly 400 patents representing the inventions of colored people.

In 1913, Henry E. Baker[2], an assistant Examiner in the United States Patent Office, became interested in finding out how many patents had been awarded to Negro inventors. The Patent Office addressed a circular letter to over eight thousand patent attorneys throughout the country, popular newspapers, conspicuous citizens of both races, and owners of large manufacturing industries where skilled mechanics of both races were employed. As a result of this survey, eight hundred (800) verified patents to Negro inventors were discovered including such fields as mechanics, chemical compounds, surgical instruments, electrical utilities, fine arts, agricultural implements, wood and metal working machines, aeronautics, and mechanical toys.

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[2] Baker, Henry E., The Colored Inventor - A Record of Fifty Years, The Crisis Publishing Company, 1913

By 1940, an investigation identified as Negroes more than 1500 inventors. The exact number was not known since many Negro inventors did not want to disclose their race for fear it might interfere with the success of their undertaking.

Often what the Negro actually developed was exploited by the white man who employed him. This situation has given support to the contentions that Eli Whitney's ideas for the construction of the cotton gin were taken over from Negroes with whom he came into contact in the south.[3] Many speak of the aid that McCormick got from his black co-worker in making the reaper.

Of course it should be recalled that in the time of slavery, a slave could not legally secure a patent on his invention. An interesting case arose, in this connection, when a Negro slave in Mississippi in 1857 perfected a valuable invention which his master sought to have protected by a patent since a slave could not take a patent out for his own invention. By law, a patent is a contract between the government and the inventor. The slave, although the inventor, could not under the law be a party to a

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3. Negro History Bulletin, vol. 3, no. 6, The American Negro As An Inventor, March 1940, Association for the Study of Negro Life and History, Washington, D. C.

contract and therefore could not secure the patent himself. His master applied for the patent but was refused on the ground that inasmuch as he was not the inventor and could not be the assignee of a slave, he could not properly make the required oath. The master appealed to the Secretary of the Interior who, in 1858, referred the case to the Attorney General of the United States. This latter official, Hon. Jeremiah S. Black of Pennsylvania, confirmed the decision of the Commissioner of Patents and neither master nor slave was ever able to get a patent for the slave's invention.[4]

A similar situation arose when Benjamin T. Montgomery, a slave belonging to Jefferson Davis, invented a boat propeller which Davis tried to patent. He was unable to do so. When the Confederate States of America set up a new constitution in 1861, it was specifically provided by law that in case a slave invented an appliance the master, upon oath, that he was the owner of such slave, could have the device patented.

In this section on Negro inventors, I shall provide resource material for the following:

Benjamin Banneker	1731 - 1806
Norbert Rillieux	1806 - 1899
Elijah McCoy	1844 - 1929
Lewis Latimer	1848 - 1928
Jan Matzeliger	1852 - 1889
Granville T. Woods	1856 - 1910
Garret A. Morgan	1877 - 1963

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[4] This case reported on page 171 of volume 9 of "Opinions of Attorneys-General, United States"

BENJAMIN BANNEKER

It is somewhat difficult to classify Banneker since apart from being an inventor he was also an outstanding mathematician, astronomer and architect as well. He was born near Baltimore, Maryland about 1731 and had the advantages of early literacy and a family well above the subsistence level of the seaboard frontier of his times.

The women in Banneker's life seem to have been of unusual stock. His mother was a free woman while his father was a slave. His grandmother, an Englishwoman, married and emancipated one of her slaves. This grandmother taught Banneker to read and paid his tuition at school, a private school near Baltimore open to white and Negro children (an integrated school at that time!). At school, Banneker soon distinguished himself in mathematics and in astronomy. He became extremely interested in mathematical calculations relating to the stars and the constellations. He found mistakes in the calculations of some of the leading authorities of that time, and predicted solar eclipses and other heavenly phenomena based upon his own calculations. Thus, in 1789 Banneker accurately predicted a solar eclipse.

Because of his great interest in astronomy and mathematics, Banneker prepared an almanac which included the time of eclipses, the hours of sunrise and sunset, a tide table for Chesapeake Bay, festival days, holidays, etc. In his day, the almanac was the most comprehensive form of scientific information even though much of it would not be considered scientific today. Banneker even included a list of medicines to help ward off diseases.

In 1753, at the age of twenty two years, Banneker constructed the first clock built in the United States that struck the hour.

He built this clock patterned after a watch that was given to him and built it entirely out of wood, carving each of the wood gears by hand. The clock kept perfect time, striking every hour for over twenty years!

Banneker had an interesting relationship with Thomas Jefferson, then a member of George Washington's administration. Jefferson had made the remark that no colored man could probably be found who was capable of taking in and comprehending Euclid, and that no colored man had made any contribution to the civilization of the world through his art. Banneker exchanged many letters with Jefferson on that subject and thereby struck up a warm acquaintance. When Banneker sent Jefferson a copy of his Almanac, the latter was so impressed that he sent copies of it to Paris and other European cities where it was highly regarded. There is a twelve page letter from Banneker to Thomas Jefferson, published in 1792, in which Banneker defends the mental capacities of the Negro.

In 1789 Thomas Jefferson procured Banneker's appointment as a member of the engineering team of Major Pierre Charles L'Enfant, authorized to lay out the site of the proposed capital city of Washington. The assignment was to define the boundaries of the city of Washington and then design and lay out its streets. There were some misunderstandings about the assignment as a result of which the highly sensitive Major L'Enfant resigned his position and returned to France taking all the plans for the city of Washington with him. Here, however, Banneker's most remarkable memory and mind came to the rescue! Having seen the plans before they were so unceremoniously taken off to France, he was able to sit down and draw them from memory. In this way the work of laying out the city of Washington with all of its major buildings was completed and is today a monument to his genius.

Banneker was deeply interested in the plight of Negro slaves in his day and printed a good deal of antislavery material. It is significant that he saw the need for, and proposed the establishment of a Department of Peace within the Executive branch of our government, with a Secretary of Peace in charge.

Banneker lived out his later years peacefully on his farm where he was sought out by distinguished men of science and art. He kept a careful journal. This journal and copies of his almanacs are to be found in the Maryland Historical Society as well as in the Library of Congress.

NORBERT RILLIEUX

On March 17, 1806 a child was born on a New Orleans plantation. The child's mother was a slave on the plantation and his father was the master of the plantation, a wealthy Frenchman and engineer. That child, of course, was Norbert Rillieux.

His birth record, now on file in the city of New Orleans, lists, "Norbert Rillieux, quadroon libre, natural son of Vincent Rillieux and Constance Vivant, born March 17, 1806. Baptized in St. Louis Cathedral by Pere Antoine."

It must be pointed out here that Rillieux's experience was very unlike that of other Negroes of his time. He was always in a well-to-do and cultural milieu because of his father's position and wealth. When old enough to go to school, Rillieux was sent to Paris to be educated. This, no doubt, was dictated by the lack of opportunity for a proper education for him in New Orleans where educational opportunities for Negroes was probably unknown. Norbert became a brilliant student at L'Ecole Centrale in Paris. He showed an extraordinary aptitude for engineering, and at the age of 24 he became an instructor of Applied Mechanics at L'Ecole Centrale. In 1830 he published a series of papers on steam engine work and steam economy that created favorable attention in scientific circles all over Europe.

It was while Rillieux was an instructor in Applied Mechanics at L'Ecole Centrale in Paris that he invented what was known as the "Vacuum Evaporating Pan". This invention revolutionized the production of sugar and was soon in use throughout the world!

Perhaps Rillieux's interest in the sugar refining process stemmed from his memory of seeing gangs of sweating Negro slaves in New Orleans painfully pouring and ladling boiling sugar cane juice from one steaming, open kettle to another. Until 1846, the transformation of sugar cane juice into sugar was accomplished by a primitive method called the "Jamaica Train", a slow and costly process. Although man had finally learned to make sugar from the juice of sugar cane and later from beets, the sugar available was only in dark, crude form, sometimes so crude as to look almost like molasses. What was needed was some way to refine and granulate sugar so as to produce it with the same sweetness but without the crude effects. Rillieux set about to accomplish this task.

Before Rillieux, two other scientists - Howard and DeGrand - had developed vacuum pans and condensing coils which imperfectly utilized heat in evaporating the liquid portion of the sugar cane juice. It remained for Rillieux, by a stroke of genius, to enclose the condensing coils in a vacuum chamber and to employ the vapor from this first condensing chamber for evaporating the juice in a second chamber under higher vacuum. The principles involved in this plan laid the foundation for all modern industrial evaporation. Rillieux's inventions are covered by two patents from the United States Patent Office: one is Patent number 3,237 and is dated August 26, 1843; and the other is Patent number 4,879 and is dated December 10, 1846.

In the earlier patent, Rillieux describes his invention, in part, with the following words, "The first improvement is in the manner of connecting a steam-engine with the evaporating pan or pans in such manner that the engine shall be operated by the steam in its passage to the evaporating pan or pans, and the flow of steam be so regulated by a weighted or other valve as to reach the said pan or pans at the temperature required for the process - that is to say, where the saccharine juice boiled - the steam at the same time having access to the pan or evaporator without passing through the engine by the said valve, which is weighted or otherwise regulated to insure the supply of steam to the said pan or evaporator at the required pressure."

After a full description, accompanied by complete and elaborate diagrams, of his evaporating pans covered by the later patent in 1846, Rillieux states at the end of his patent description:

> "Having thus pointed out the principle or character of my improvements and the manner of constructing and applying the same, what I claim as my invention, and desire to secure by Letters Patent, is -
>
> 1. The method of heating the saccharine juice in a heater preparatory to its introduction in the evaporating pans, by means of the waste hot water or escape steam from the evaporating pans.
>
> 2. The method of clarifying saccharine juice by heating it in a heater provided with a spout for the discharge of the impurities in the form of scum, and a pipe for drawing off the clear liquid ....
>
> 3. The method of cooling and partially evaporating saccharine juice or other liquids by discharging the same in the form of spray or drops in a chamber, where it meets with a current of air; ......, and this I also claim in combination with a condenser whereby the liquid intended to be concentrated is prepared for the evaporating pans and used as a means of condensing the vapor from the pans in which it is to be concentrated, or by means of which the water used for the condensing jet is recooled.
>
> 4. The method, substantially as described, of combining a vacuum striking pan with a series of evaporating pans, the last of which is independent of the striking pan, and the last of the series of evaporating pans can be in connection with the condenser and work independently

> of each other, that either the striking pan or the series of evaporating pans can be worked without the other, as described.

Rillieux's idea caught on in America and he was offered the post of Chief Engineer in Edmund Forstall's New Orleans sugar factory. He accepted the position and returned to the United States only to leave the job after a short time because of a disagreement. He then installed the first working model of his triple-effect evaporator on the plantation of Zenon Ramon in Louisiana. Unfortunately there were mechanical difficulties and the machine failed. It was not until several years later that Rillieux tried again. Another plantation owner, Theordore Packwood, encouraged Rillieux to design another triple-effect evaporator. It took Rillieux almost two years, but in 1845 the machine was installed on Packwood's Myrtle Grove Plantation and was a complete success!

This new apparatus revolutionized the manufacture and refining of sugar. Soon other Louisiana factories installed the system. A superior sugar product was secured at a greatly reduced cost. Factories sprang up all over Louisiana, Cuba, and Mexico, using the "Rillieux System". Dr. Charles A. Browne, sugar chemist in the United States Department of Agriculture, said, "I have held that Rillieux's invention is the greatest in the history of American chemical engineering and I know of no other invention that has brought so great a saving to all branches of chemical engineering."

Today the process of evaporation in multiple effects is universally used throughout the sugar industry as well as in the manufacture of condensed milk, soap, gelatin and glue, and in the recovery of waste liquors in distilleries and paper factories.

The underlying principle on which these evaporators operate has not altered materially since Rillieux first designed his system.

While Rillieux, through his inventions, became one of the most important men in Louisiana, he could not take part in its affairs unless he was invited. Although not a slave, he was still of the colored race. He accepted this, with what grace one can imagine, until he was required by Louisiana to carry a pass. This was too much for him to endure and in 1854 Rillieux decided to leave Louisiana forever. He returned to his beloved France and for ten years he contented himself with work on deciphering hieroglyphics. After that period, however, he returned to engineering and invention once more. He applied his evaporating pan process to sugar beets and patented a process of heating juices with vapors in multiple effect which is still used in beet-sugar factories. Production costs were cut in half.

On October 9, 1894, at the age of 89 years, Rillieux died and was buried in the Pere-LaChaise cemetery in Paris. It was not until 1934 that at the insistence of European scientists, a tablet was erected in Louisiana in his honor and dedicated by corporations representing the sugar industry from all over the world. The plaque in the Louisiana State Museum in New Orleans honors Rillieux as follows:

> "TO HONOR AND COMMEMORATE NORBERT RILLIEUX BORN AT NEW ORLEANS MARCH 18, 1806 AND DIED AT PARIS, FRANCE OCTOBER 9, 1894. INVENTOR OF MULTIPLE EVAPORATION AND ITS APPLICATION INTO THE SUGAR INDUSTRY. THIS TABLET WAS DEDICATED IN 1934 BY CORPORATIONS REPRESENTING THE SUGAR INDUSTRY ALL OVER THE WORLD."

ELIJAH J. McCOY

The expression, "It's the real McCoy!" has very much become a part of our everyday vocabulary but how many people are aware of its origin? Let us go back to a day in 1844 in Canada at which time and place Elijah McCoy was born. Why in Canada? Because his parents were slaves from the South who had escaped into Canada through the "Underground Railroad" - so called because it was made up of a movement of abolitionists and others who felt strongly against slavery and helped to move escaped slaves from the South into Canada where they could obtain their freedom and live as free men and women.

As a young mechanic working in Ypsilanti, Michigan, McCoy became very interested in machinery and engines. At that time, all kinds of engines and machinery with moving parts had to be stopped periodically and frequently for oiling or lubricating. This, of course, was a waste of both time and money. The problem intrigued McCoy and in his crude machine shop he tried various devices that would lubricate machines as they worked. In July, 1872 he was able to patent his invention of an automatic lubricator - a device that provided/or the continuous flow of oil on the gears and other moving parts of a machine in order to keep it lubricated properly and continuously and thereby obviate the necessity of shutting down the machine periodically.

In describing another early patent[5] dealing with automatic lubrication, after describing in detail the structure and parts of his lubricator, he states in the patent description, "When steam is on it presses the valve b closely against the regulator D, closing the aperture a in the same, and prevents the escape of oil. When steam is exhausted the valve b drops to the bridge d, and allows oil to escape through the tube C to the steam chest, because neither the valve nor the bridge fill the tube completely, except when the valve is pressed against the regulator D or by the steam. This lubricator oils chiefly when steam is exhausted, which is the time when oil is most needed; but if it is desired to provide for oil when the engine is working, it can readily be accomplished by simply making a channel or groove in the valve."

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[5] Patent number 139,407 dated May 27, 1873, "Improvement in Lubricators", U. S. Patent Office

McCoy went on to work in the field of automatic lubrication and held nearly forty (40) patents in this field by 1912 when the last of his patents was granted to him in July, 1912. Small wonder, then, that he is so often referred to as the "Father of Lubrication". His patents related particularly to the scheme of lubricating machinery. He was a pioneer in the art of steadily supplying oil to machinery in intermittent drops from a cup, so as to avoid the necessity of stopping the machine to oil it. His lubricating cup was in use for years on stationary and locomotive machinery in the West, including some great railway locomotives, the boiler engines of the steamers on the Great Lakes, on transatlantic steamships, and in many leading factories.

Such extensive use was made of his inventions that after a while no piece of heavy duty machinery was considered complete unless it had the "McCoy system". People inspecting a new piece of machinery would make sure that it had automatic lubrication by asking, "Is it the real McCoy?" Today, "It's the real McCoy" is used to indicate perfection.

LEWIS HOWARD LATIMER

A Negro slave escaped from Virginia and fled to Boston, Massachusetts. Not an unusual occurence in those days. In October, 1842, however, his owner - a James B. Gray - came to Boston and claimed as his slave the Negro George Latimer. This was several years after Latimer had settled down and lived in Boston. The Latimer case became the first of several famous Boston fugitive slave cases. Abolitionists such as William Lloyd Garrison and Frederick Douglass took up Latimer's case so that a month later sufficient funds were raised (four hundred dollars) to purchase Latimer's freedom. Shortly thereafter Massachusetts passed a Personal Liberty Law forbidding state officers from participating in the hunting for fugutive slaves. Such was the story of George Latimer, the father of our scientist, Lewis Howard Latimer.

Lewis Latimer was born at Chelsea, Massachusetts on the 4th day of September, 1848 - six years after his father had secured his freedom from slavery. At the age of ten, after a series of reverses which included desertion of the family by the father, Lewis had to forget about schooling and go to work to support himself and help support the family of four children.

At the age of sixteen, he enlisted in the United States Naval service, serving as a "landsman"on the U. S. S. Massasoit from which he was honorably discharged in 1865. At that time he returned to Boston and secured employment as an office boy in the office of Messrs. Crosby and Gould, patent solicitors. It was in this office that Latimer became interested in drafting. With a second-hand set of drafting tools, some library books on the subject, and the aid of some kind draftsman, Latimer gradually learned enough about drafting to be given a position as draftsman with the same office. He perfected himself to such a degree as to become their chief draftsman, remaining with the firm for about eleven years.

The office where Latimer was employed was located near a school where Alexander Graham Bell taught deaf and dumb persons. In the course of trying to invent a machine that would enable deaf people to hear, Bell invented the telephone. It was Lewis Latimer who executed the drawings and assisted in preparing the applications for the telephone patents of Alexander Graham Bell.

In 1880 Latimer entered the employ of Hiram S. Maxim of the United States Electric Lighting Company, then located at Bridgeport, Connecticut. It was while in this employ that Mr. Latimer successfully produced a method for making carbon filaments for the Maxim electric incandescent lamp, which he patented. On September 13, 1881 Latimer and one Joseph V. Nichols of Brooklyn, New York were given a patent (Patent number 247,097) for "certain new and useful improvements in incandescent electric lamps". In the description supplied by the authors of this patent, it states, "Our invention relates to electric lamps in which the light is produced by the incandescence of a continuous strip of carbon secured to metallic wires and inclosed in a hermetically sealed and thoroughly exhausted transparent receiver; and it relates more especially to the method of mounting the carbons or connecting them with the wires."

His keen perception of the possibilities of the elecgric light and kindred industries resulted in his being the author of several other inventions. Among these were a "Globe Supporter for Electric Lamps" (invented together with Tregoning and patented on March 21, 1882), "Manufacturing Carbons" (April 17, 1882), "Apparatus for Cooling and Disinfecting" (January 12, 1886), and "Locking Racks for Hats, Coats and Umbrellas" (March 24, 1896).

Latimer assisted in installing and placing in operation some of the first "Maxim" incandescent electric light plants in New York City, Philadelphia and Canada for the United States Electric Light Company, and supervised the production of the carbon filaments employed therein. Some of the large buildings electrified by Latimer were the Equitable Building, Fiske and Hatch, and the Union League Club of New York City, as well as the offices of the Philadelphia Ledger in Philadelphia. In the autumn of 1881, Latimer was sent to London, England to establish an incandescent lamp department for the Maxim-Weston Electric Light Company. In 1882-3 he was employed by the Olmstead Electric Lighting Company of Brooklyn, New York and then by the Acme Electric Light Company of New York City.

In 1884 he became associated with the Engineering Department of the Edison Electric Light Company at 65 Fifth Avenue, New York City. In 1890 he was transferred to the Legal Department where he remained until the formation of the Board of Patent Control in 1896 by the General Electric and ~~Mx~~ Westinghouse Companies, becoming its chief draftsman, a position he held until the abolition of this Board in 1911, when he became associated with Edwin W. Hammer, Patent Solicitor and Engineer of New York City, and later with the firm of Hammer and Schwarz.

In 1890 Latimer wrote the standard book on electric lighting[6] wherein he describes the way in which light is obtained by heating an electric wire to incandescence. After describing the electric lamp itself, he gives the following interesting account of the principles involved:

> "If the electric current can be forced through a substance that is a poor conductor, it will create a degree of heat in that substance which will be greater or less according to the quality of electricity through it. Upon this principle of the heating effect of the electric current, is based the operation of the incandescent lamp just described. While the copper and platinum wires readily conduct the current, the carbon filament offers a great deal of resistance to its passage and for this reason becomes very hot, in fact is raised to white heat or incandescence, which gives its name to the lamp. You doubtless wonder why this thread of charcoal is not immediately consumed, when in this state, but this is readily accounted for when you remember that without the oxygen of the air, there can be no combustion, and that every possible trace of air has been removed from the bulb and it is so thoroughly sealed up as to prevent the admission of the air about it; and yet the lamp does not last forever, for the reason that the action of the current upon the carbon has a tendency to divide up its particles and transfer them from one filament to another so that, sooner or later, the filament gives way at some point. Yet most of these lamps are guaranteed to last 1000 hours and this at from four to six hours a day gives the lamp a life of several months."

Latimer was always a valued aid to Thomas Edison. Edison was repeatedly involved in lawsuits which he had to institute against the companies who infringed upon his patents. In all these suits, some of which involved millions of dollars, Latimer as the original draftsman was Edison's star witness, and the suits were often decided by his testimony.

Latimer's activities were brought to an unfortunate conclusion in the early part of 1924 by illness that finally caused his death in 1928.

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[6] Latimer, Lewis H., Incandescent Electric Lighting. A Practical Description of the Edison System. New York: D. Van Nostrand Company, 1890.

The Edison Pioneers is an organization made up of those scientists who actually worked with Thomas Edison in his pioneering work in the field of electricity. Upon Latimer's death in 1928, the Edison Pioneers, of which Latimer was a member and the only Negro member, paid tribute to him publicly. Among the thoughts contained in the tribute were the following:

> "We hardly mourn his inevitable going so much as we rejoice in pleasant memory at having been associated with him in a great work for all peoples under a great man.
>
> He was of the colored race, the only one in our organization, and was one of those to respond to the initial call that led to the formation of the Edison Pioneers, January 24, 1918. Broadmindedness, versatility in the accomplishment of things intellectual and cultural, a linguist, a devoted husband and father, all were characteristic of him, and his genial presence will be missed from our gatherings.
>
> Mr. Latimer was a full member, and an esteemed one, of the
>
> Edison Pioneers "

On November 9, 1929 an article in a New York newspaper - The New York Age - stated, "One of the interesting features in connection with the recent 'Light's Golden Jubilee', celebrating the 50th anniversary of Thomas A. Edison's invention of the electric light, was the presence of two daughters of the late Lewis Howard Latimore, the only colored member of the Edison Pioneers, the group of workers who were associated with Edison in the development of his electrical inventions."

In 1954, however, when the 75th anniversary of Edison's invention was being celebrated, no mention was made in the course of the celebrations of the role played by Lewis Latimer. His two daughters were guests of honor at the 50th anniversary celebration of the electric light held at that time. What happened by 1954 - the 75th anniversary? Has the only Negro member of Edison Pioneers been already forgotten??

This researcher was fortunate in being able to locate Lewis Latimer's granddaughter and spent some time with her in checking over many of the facts uncovered concerning Latimer's background in the field of electricity. Since she lives in New York City (935 St. Nicholas Avenue) as does the researcher, making contact was quite simple. Her full name is Miss Winifred Latimer Norman and she is a social worker. She informed the writer that the New York City Board of Education has just finished the construction of Public School 56 Brooklyn which will be named in honor of her grandfather, Lewis Howard Latimer. In fact, the writer was invited to attend the ceremony at which the naming will be made official.

Miss Norman has a wealth of material, in the form of letters, pictures, manuscripts, etc., dealing with the life and work of Lewis Latimer. Unfortunately, however, she has not as yet decided to make it available to the general public nor to the writer. She had promised, some time ago, to donate it to the Schomberg Collection, a branch of the New York Public Library specializing in Negro affairs. To date, however, this has not been done. The writer is still in touch with Miss Norman and hopes to have some of the material made available to him for the purposes of this research.

JAN EARNST MATZELIGER

The United Shoe Machinery Company is one of the largest and richest corporation of its kind in the world! It employs more than four thousand persons and its factories cover 21 acres of land. Its working capital runs into the millions. It is difficult to realize that all this wealth and all this know-how in the shoe industry stems from the remarkable work of the inventor, Jan Earnst Matzeliger, who himself died at an early age and in poverty.

Just as Elias Howe was to the sewing machine, so was Jan Matzeliger to the shoe-lasting machine. How did it all begin?

Born in Paramberio, Dutch Guiana on September 15, 1852, Jan Matzeliger was put to work by his father, at the tender age of ten, in the government machine works where he served as an apprentice. He apparently learned his trade well. When he came of age, he married a native girl and emigrated to the United States to make his fortune. He came to, and settled in Lynn, Massachusetts in 1878 where he worked in the factory of the Harney Brothers, a shoe manufacturing concern. While there were several machines in use in the shoe making industry, there was no machine for connecting the "uppers" to the soles of the shoes. This had to be done by hand, and it was generally felt that no machine could ever be devised to do this task. This was a challenge to Matzeliger. He strongly felt that he could make a machine that would "last" shoes. Men jeered at him for his ideas and many a joke was turned at his expense.

This did not bother Matzeliger. He rented a cheap room over the old West Lynn Mission and there he experimented at night after putting in long and exhausting hours at his regular job. The lack of proper heating facilities did not improve his health any and in all probability contributed a good deal to his contracting tuberculosis which proved to be fatal. He utilized pieces of wood, old cigar boxes and other scrap materials, and he improvised tools. He used an old forge to mold the gears and cams that went into his working models.

After six months, he had a crude model which worked. He was offered fifty dollars for the model but refused. Four years went by, with constant experimentation and not a little discouragement, before Matzeliger succeeded in making a model machine which was capable of pleating the leather around the toe and heel of a shoe. This was in September, 1880. He was offered fifteen hundred dollars ($1,500) for this model but again refused.

Although very poor and ill in health, Matzeliger began on a third machine which he completed and patented on March 20, 1883. He was not completely satisfied with his machine and continued to work to perfect it. Thus, he completed a fourth machine which held the last in position and moved it forward, while other parts punched the leather and drew it over the last, fitted the leather at toe and heel, fed nails into position so that the operator could drive them, and did all this so smoothly that a shoe could be completed in the space of one minute!

Matzeliger's final product does so many operations with the one machine that it revolutionized the entire shoe industry. Lynn, Massachusetts became the world's largest shoe manufacturing center.

To give the reader some idea of what the machine actually does, it would be well to quote Matzeliger's own words in the description of his patent:

> "My invention relates to the lasting of boots and shoes. The object of it is to perform by machinery and in a more expeditious and economical manner the operations which have heretofore been performed by hand.
>
> Heretofore devices have been contrived for performing a part of the operation, such as holding the last in proper position and drawing the leather over the last, while the nailing was done by hand. In my machine, I perform all the operations by the machine, and automatically, requiring only the service of a boy or girl or other unskilled labor to attend the machine.
>
> My invention includes the mechanism for holding the last in place and allowing it to be turned and the last fed forward in proper position for the operation of the machine. It includes a feeding device for moving the last step by step at a proper distance, whereby the mechanism for drawing over the leather may operate successively and at proper intervals. It includes pinchers or gripping mechanism for drawing the upper over the last, mechanism for turning the gripping mechanism in order to plait the leather at the heel or toe, mechanism for holding the last in proper position for the operation of the feeding mechanism, mechanism for feeding the nails and holding them in proper position to be driven, and mechanism for driving the nails at the proper instant. The details of construction are all fully set forth hereinafter, and, together with the principles of my invention, are stated in the claims. "

Matzeliger attempted to capitalize his invention by organizing a stock company to market his invention and he began to try to sell stock in his company. However his plans were frustrated through lack of business experience as well as through failing health. The strain of overwork and the frustration of poverty proved to be too much for Matzeliger's health. He developed tuberculosis and died on August 24, 1889 at the age of thirty seven. Matzeliger's patents were purchased by a Sidney Winslow who in turn bought up forty small companies to organize the present United Shoe Machinery Company, one of the largest and richest corporations in the world. The company never sells the shoe machine but it may be leased for ninety nine years - much as I.B.M. machines are handled today. It is interesting to note that one of the original stockholders gave Harvard University five million dollars to establish an Engineering School.

Ironically, the only recognition that the shoe industry has given this Negro inventor is to nickname his revolutionary invention the "Nigger Head" machine.

Some years before his death, Matzeliger became a member of a white church in Lynn called the North Congregational Society. He bequeathed some of the stock of the company that he organized to this church. Years later, this church became heavily involved in debt and remembering the stock that had been left to it by this colored member found, upon inquiry, that it had become very valuable through the importance of the patent under the management of the large company then controlling it. The church sold the stock and realized from its sale more than enough to pay off the entire debt of the church which amounted to $10,860. With the cancelled mortage as one incentive, this church held a special service of thanks, one Sunday morning, on which occasion a life-sized portrait of their benefactor looked down from the platform on the immense congregation below, while a young white lady, a member of the church, read a eulogy of the deceased and the pastor, Reverend A. J. Covell, preached an eloquent sermon, the text found in Romans 13:8 - "Owe no man anything but to love one another."

GRANVILLE T. WOODS

What makes a person an "educated man"? Is it formal schooling or can it also be the "school of hard knocks"? Certainly Granville Woods was an "educated" man even though he never had the opportunity to complete even a grammar school formal education. Like Lewis Latimer, at the age of ten Woods had to go to work where he learned his skills on the job. How much greater would his contributions have been had he had the opportunity for college and higher training?

Granville Woods is called the "Black Edison" because of his persistent and successful investigations into the mystery of electricity. Among his inventions may be found valuable improvements in telegraphy, important telephone instruments, a system for telegraphing from moving trains, an electric railway, a phonograph, and an automatic cutoff for an electric circuit. One of his telephone inventions was sold to the American Bell Telephone Company who is said to have paid Mr. Woods handsomely for his patent.

Woods had over sixty patents, mostly on electrical subjects. Several patents were assigned by Woods to the General Electric Company of New York and to the Westinghouse Air Brake Company. In his early thirties, Woods became interested in thermal power and steam-driven engines. In 1889 he secured his first patent on an improved steam-boiler furnace. Then he invented an electric incubator in 1900. After that he patented a series of advances in the development of air brakes.

His interest then went on to railways and he invented fifteen appliances for electric railways; the greatest of these being a telegraph system that enabled moving trains to communicate with each other. Woods went on to organize the Woods Electrical Company. In later years, he sold a number of his inventions to several of the country's largest corporations as mentioned previously.

In a description of his apparatus for transmission of messages by electricity (Patent number 315,368 - April 7, 1885), Woods puts it in this way:

> "In the ordinary mode of sending telegraphic messages the operator uses a "finger-key" whose duties are to irregularly make and break the circuit or to vary the tension of the electric current traversing the 'line wire', the 'key' being operated by the varying pressure of the operator's finger. This key as ordinarily constructed cannot be operated in any other way or for any other purpose than just mentioned. The message thus transmitted is received by an instrument known as a 'receiver' or 'sounder', which causes audible atmospheric vibrations in response to the pulsations of the electric current traversing the line-wire.
>
> It is well known that both the sender and the recipient of messages thus transmitted must be skilled operators. It is also well known that such sounder as usually constructed will not respond to very weak electric currents, such as are used in telephony. My system (called by me 'Telegraphony') entirely overcomes the failings of the ordinary key and sounder and has a wide range of usefulness, it being capable of use by inexperienced persons, for if, for example, the operator cannot read or write the Morse signals, he has only (by means of a suitable switch) to 'cut' the battery out of the main-line circuit and cut it into a local circuit and then speak near the key. This having been done, the sounder at the receiving station will cause the air to vibrate in unison with the electric pulsations that traverse the line-wire. The person at the receiving-station will thus receive the message as articulate speech. "

GARRET A. MORGAN

How many veterans of World War I and succeeding wars owe their lives to Garret Morgan? When wave after wave of chlorine gas and other poison gases would come over from the enemy side, out would come the gas masks, invented by Morgan, that would save their lives.

Morgan was born in Paris, Kentucky on March 4, 1877. Not much is known of his early life. It was known that he was working on a "gas inhalator" or gas mask as we know it today. He tried to interest some Ohio industrialists in his invention without any positive results.

Morgan's big opportunity came on July 25, 1916 when an explosion in a tunnel almost 300 feet below Lake Erie trapped twenty men working there. It was impossible for anyone to go into the tunnel to search for survivors because the tunnel was filled with gases, smoke, dust and debris. It was then that someone remembered about Morgan's invention and Morgan was summoned. He arrived quickly together with his brother and two gas inhalators or gas masks. While crowds waited patiently at the entrance to the tunnel, the two brothers donned the gas masks and descended into the smoke filled tunnel. After what seemed like an eternity, Morgan came out carrying a survivor. He then re-entered the tunnel many times until he had saved over a score of workmen.

Morgan was awarded a gold medal by Cleveland for his heroism in the tunnel explosion, but more important he proved the worth of his invention - the gas mask. His mask was also used to combat poison gas attacks during World War I and in succeeding wars. Needless to say, it also has many peacetime uses. Today special gas masks are made to protect against special poison gases. For example, the ordinary gas mask does not protect against cyanide gas and special ones have to be built to protect against this gas. In fumigating buildings with cyanide gas, Public Health officials wear this special gas mask and make careful notations of how many hours the mask was used. This is to make sure that the material in the gas mask is not used up and therefore inactive.

In 1924 Morgan also invented the first electric stop light signal that has also been so instrumental in saving lives on the roads, highways and railways. He sold the rights to this invention to a large corporation for the sum of forty thousand dollars.

Morgan died on August 27, 1963 at the age of 86.

MIRIAM E. BENJAMIN

The name of Miriam Benjamin is mentioned here, not because of the importance of her invention but because she was the only colored woman to receive a patent for an invention.

On July 17, 1888 (Patent number 386,286) Miss Benjamin received a patent for her invention - a gong signal. The principle of her invention has been adopted by the United States House of Representatives in signalling for the pages to attend upon members who want them for errands. Formerly the pages were signalled by members clapping their hands. The noise incident to this method was frequently a great disturbance of the House proceedings.

The new system that was adopted involved merely the pressing of a button on the member's chair which in turn rang a small gong while displaying a signal on the back of the member's chair.

II. BIOLOGISTS

In this section will be described the role and contributions of the following Negro scientists to the field of Biology:

Charles H. Turner	1867 - 1923
William A. Hinton	1883 - 1959
Ernest E. Just	1884 - 1940
Charles W. Buggs	1906 -

It should be pointed out that the job of classifying the work of a scientist into one of the specific areas of science is not an easy one today. Science has become too interrelated and fortunately so. Thus, while Hinton's work was in the area of bacteriology, a branch of biology, his main contribution was in the field of medicine where he devised a sensitive test for the presence of syphilis. Much of the modern work in biology is indistinguishable from work in chemistry. In fact, a very close relationship has developed between chemistry and physics with the modern atomic theory uniting the two.

It is in this perspective, therefore, that these categories of science are stipulated "with caution" and solely for the purpose of trying to fit the work of these men into the appropriate areas and sections of science curricula and courses of study.

CHARLES HENRY TURNER

1867 - 1923

Charles Turner may be said to be typical of many Negro scientists whose outstanding work and contributions in the field of science has had so little recognition.

Turner was one of the most productive students in the field of animal behavior that this country has ever produced. He was a pioneer in the systematic observations on the life habits and social organizations of smaller insects and animals, especially bees and ants. His fundamental observations in this field laid the groundwork which eventuated in the establishment of the school of behavioristic psychology.

He received the degree of PhD from the University of Chicago in 1907 where he specialized in entomology and insect behavior. From 1892 to 1923 he published no less than forty nine (49) papers on the invertebrates. In spite of all these accomplishments, Turner never received the recognition he so richly deserved, and for most of his life he taught biology at the Sumner High School in St. Louis.

WILLIAM A. HINTON

1883 - 1959

Dr. Hinton was one of the finest research men in the field of bacteriology and immunology in the country. An outstanding and brilliant student at Harvard Medical School, he graduated in 1912 and became a member of the faculty of Harvard University soon after his graduation. He remained a member of the faculty for thirty five (35) years.

He was also associated with the State Department of Health of Boston, Massachusetts in the area of public health. One of his outstanding contributions is the clinical test that he devised for the detection of the presence of syphilis. The test, which goes by his name - the Hinton Test - is one of the most sensitive tests that is used in the clinical laboratory to test for the presence of syphilis. It is more sensitive than the routinely used Wasserman or Kahn tests.

ERNEST EVERETT JUST

1884 - 1940

Dr. Just was one of America's most distinguished biologists. Born in Charleston, South Carolina in 1884, he attended the Industrial School of Orangeburg (now the South Carolina State College), the Kimball Academy in New Hampshire, and Dartmouth College where he graduated with the A.B. degree in 1907, the only magna cum laude of his class. Besides being elected to the Phi Beta Kappa honorary society at Dartmouth College, he received special honors in zoology and history.

He did his graduate work at the University of Chicago where he was awarded the PhD degree in 1916 in the field of Experimental Zoology. He continued his graduate studies at the Marine Biological Laboratory in Woods Hole, Massachusetts where he did some outstanding work for the Government. His first work there, in 1909, was in the field of Marine Invertebrates and later on he went into the field of Embryology.

From 1911 to 1912 he was research assistant in the study of the fertilization and breeding habits in Nereis and the sea urchin Arbacia. Marine eggs then became the center of his research. His first research paper (in 1912) was on the development of the eggs of the annelid Nereis. This was followed by about fifty (50) research papers in the next twenty five years on fertilization and experimental parthenogenesis in marine eggs. His work by that time was supported in part by such organizations as the Julius Rosenwald Foundation and the Carnegie Corporation.

In 1915, at the age of 31, Just was the first winner of the Spingarn Medal. This is a Medal awarded by the National Association for the Advancement of Colored People to the man or woman of African descent who shall have made the highest achievement during the preceding year or years in any honorable field of human endeavor.

In 1939, Just published two books. One is titled, "Basic Methods for Experiments in Eggs of Marine Animals". The other is "The Biology of the Cell Surface". This latter book represented the results of a lifetime on research by Just. It was an attack on the traditional Weissman-Morgan biology and gene theory strikingly similar to, but developed independently of the work of Soviet scientists Michurin and Lysenko. Just insisted on the interdependence and interaction of cytoplasm and nuclear constituents of the cell, and emphasized the significance of environment.

Just carried on his studies and research at the Kaiser Wilhelm Institut fur Biologie in Berlin in the 1930's, as well as at the Sorbonne in Paris and the Zoological Station in Naples, Italy. He was honored and respected at these European research laboratories for his scientific scholarship.

From 1907 to his death in 1940, Just was on the faculty of Howard University. He was Professor of Zoology at Howard University and Professor of Physiology at Howard Medical College. His professional activities included the vice-presidency of the American Society of Zoologists, and associate editorship of the Biological Bulletin, the Journal of Morphology, and Physiological Zoology.

CHARLES WESLEY BUGGS

1906 -

Dr. Buggs made his greatest contribution in the field of research on the treatment of wound infections and burns. In this connection he is the key figure in this research area at Wayne University.

Born in 1906 in Brunswick, Georgia and raised there, Buggs went to Morehous College where he received his bachelor's degree in 1928. He then attended the University of Minnesota where he earned the Master's degree in 1931. It was at the University of Chicago where, in 1934, he was awarded the PhD degree.

He taught at the Dillard University and went on to become Professor and Chairman of the Natural Science Department there. It was there also that he wrote a book, "Lecture Outlines and Syllabus on the Principles of Animal Biology". In 1943 he went to the Wayne University where he was the first Negro to hold a full time position on its faculty.

His principal work was in the area of the treatment of wound infections and burns. In this connection he carried on a number of studies as indicated by the following publications:

1. Properties of Homogenized Herpes Virus, Journal of Infectious Diseases, 58:January-February 1936; p.98-104
2. Experimental Investigations in Hemorrhagic encephalitis, Journal of Infectious Diseases, 62: May-June 1938; p. 293
3. The In Vitro Action of Streptomycin on Bacteria, Journal of the American Medical Association, 130: p.64-67
4. The Presence in Normal Serum of Inhibiting Substances Against Bacillus Subtilis, Science 103: 363-4, March 22, 1946
5. Absorption, Distribution and Excretion of Streptomycin in Man, Jour. of Clinical Investigations, 25:94-102, Jan. 1946

III. CHEMISTS

This section will be devoted to the contributions made by Negro scientists in the field of Chemistry. Again it should be noted that this type of classification almost becomes arbitrary because the fields overlap to the extent that they do. Carver's work, for example, while mostly in the area of chemistry (he is often referred to as an agricultural chemist) certainly leans very heavily toward the area of Biology and he could certainly be included in the field of Biology when many of his works are considered. Much of Julian's work, while principally in the field of Chemistry, affects large areas in what we could easily term the field of Biology and Medicine.

The following Negro chemists will be reported on in this section:

George Washington Carver	1860-1943
Bruce H. Green	1878-1937
Lloyd A. Hall	1894-
Robert P. Barnes	1898-
Percy L. Julian	1898-

One should note that most of the Negro scientists contained in this report are from the 1850's and later. This is no accident, if one recalls that prior to that time either Negroes were slaves with no opportunities, or free men with very little opportunities (unlike Rillieux) until after the Civil War.

GEORGE WASHINGTON CARVER

1860 - 1943

Carver was the first and probably the greatest chemurgist (agricultural chemist). He is perhaps best known throughout the world for his fantastic work with the peanut, the sweet potato, and other plants.

It is not the purpose of this report to go into the well known life and background of Carver since that is known to every elementary and high school student. It is common knowledge that he was stolen by raiders from the plantation of Moses Carver and was ransomed in exchange for a racing horse. He was born in 1860 at Diamond Grove, Missouri. It was soon recognized by his owner that he was not much good as a field hand, because of his frailty, but that he had a very good mind. He was sent to Neosho, the Newton County seat, in southwest Missouri where he worked as a farm hand and studied in a one-room, one-teacher school. He received excellent grades. He was accepted by Simpson College in Iowa where he was the first Negro student. There too his record was outstanding.

After graduating from Simpson College, Carver was accepted to Iowa Agricultural College (now Iowa State University) at Ames, Iowa where he studied agricultural science and received the master's degree in 1896. He was then elected to the faculty of Iowa Agricultural College - the first Negro to serve on that faculty. In 1896 he was invited by Booker T. Washington to come to Tuskegee Institute in Alabama. There he became the Director of Tuskegee's Department of Agricultural Research. It was while he was there that he did all of that important work in an effort to show the farmers of the South that they could diversify their crops and not have to depend on single money crops like cotton, tobacco or rice. Since peanuts are leguminous plants that return valuable nitrogenous material to the soil, Carver urged the farmers to rotate their money crops with peanuts. When this was done, peanuts became so abundant that Carver sought ways and means of utilizing the peanut. He wound up with over 300 products from the peanut such as dyes, plastics, soap, ink and many others now in common use.

By this time he was offered positions carrying enormous salaries by Henry Ford, Thomas Edison, and others. But Carver was not interested in money. In fact, it is said that he failed to cash many of his salary checks.

His earliest scientific contribution was his investigation of ferns, reported in a paper (Iowa State College, Agricultural Bulletin, No. 27, 1895, p. 150-153) giving the conditions under which they grow in the North and Northwest. Together with his teacher, Louis Herman Pammell, an eminent botanist, Carver conducted experiments in plant pathology. In 1895 they published jointly significant results on the prevention and cure of spot disease of currants and cherries.

Carver also worked with F. C. Stewart conducting special investigations of several species of rust, of wheat, oats, blackberry and carnations. Other experiments of this period dealt with problems of types of soil, moisture, sunlight, rootage, rooting, cuttings and reproduction of plants.

Carver made some important discoveries in the field of plant pathology. In 1897 he reported, for the first time in America, a new species of Taphrina, a fungus found on red and silver maple trees. This species of Taphrina was named "Taphrina Carveri" (A. E. Jenkins, Journal of the Washington Academy of Sciences, 29:282, May 15, 1939). Two other fungi were named "Collectotrichum Carveri" and "Metasphaeria Carveri". Carver was the first to observe and report in America a fungus growth which caused a disease of the soybean. In 1910 he published an exhaustive study of cercosporae Canesceris.

Wade Moss, the distinguished chemist, lauds Carver for his discovery of a new synthesis of organic dyes extracted from the soils of Macon County, Alabama (W. Moss, Manufacturers Record, 98:58, July 24, 1930).

Carver defeloped over 300 products from the peanut such as milk, butter, cheese, candy, soap, oils, dyes, plastics, flour, and others. He also developed over 100 products from the sweet potato including starch, meal, flour, vinegar, and wood filler. He even developed 75 products from the pecan.

At a hearing before the Ways and Means Committee of the United States House of Representatives on the peanut tariff, he kept the committee's attention for hours with his descriptions of the many uses of the peanut demonstrated by many samples he brought with him. (Carver, G. W., Statement at hearings before the Committee on Ways and Means, House of Representatives, on schedule G, Agricultural Products and Provisions, Jan. 21, 1921, Tariff Information, 1921, Washington, D. C. Government Printing Office, 1921, p.1599).

Carver, unlike other Negro scientists, won many honors during his lifetime. He was made a fellow of the Royal Society of Arts in London in 1917. He was awarded the Spingarn Medal in 1923. He was also awarded the Theodore Roosevelt Medal for distinguished research in agricultural chemistry in 1939. This medal was accompanied by the following citation, "To a scientist humbly seeking the guidance of God and a liberator to the men of the white race as well as the black."

In 1940, the International Federation of Architects, Engineers and Chemists gave him a citation for distinguished service. He received the honorary degree of D. Sc. from the University of Rochester in 1925 and the honorary degree of Ph.D. from Simpson College that same year.

Many statements have been made that Carver never wanted to patent any of his inventions and findings. The record shows, however, that he received patents on the following dates:

June 6, 1926: patented cosmetics made from peanuts

June 9, 1926: received blanket patents covering several processes for the manufacture of paints and stains from clays and minerals

June 14, 1927: received a patent for an improved method of producing paints and stains which included a cold water process.

Many scientists are inclined to look at Carver's work as applied rather than basic research. Thus, an interesting statement appears in a pamphlet issued on the Negro in Science[7] which states, "A careful search of the data fails to show that he ever published a paper in any of the standard journals carrying accounts of research in chemistry."

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[7] Taylor, J. H., ed., The Negro In Science, Morgan State College Press, 1955

Carver never married nor had any family ties. When he died in 1943 at the age of 79, his life savings - the sum of $40,000 - was left by him to establish the George Washington Carver Foundation to help provide research opportunities for scientists at Tuskegee. A memorial is erected in his honor at Tuskegee Institute along with a museum holding thousands of momentos attesting to the love and esteem of people over the world.

The farm land near Diamond Grove, Missouri where he was born and raised is now maintained as a national monument by the United States government.

A joint resolution of Congress, approved December 28, 1945 (Public Law 290, 79th Congress) designated January 5, 1946 as George Washington Carver Day and on that day all officials of the Government were called upon to display the flag of the United States on all Government buildings.

BRUCE HENRY GREEN

1878 - 1937

Green was one of the great teachers of science as well as a naturalist. He taught chemistry. Born in Charleston, South Carolina, he took his early training at Avery Institute, in Charleston in 1894.

Four years later, he entered Brown University where he secured the degree B. S. in 1902 with a specialization in Chemistry. He took his graduate work at Wittenberg College in Springfield, Ohio where he secured his Master's degree in 1933.

In 1911 Green took a position teaching chemistry at Wilberforce University where he achieved the position of Professor of Chemistry and where he remained for more than 25 years until his death in 1937.

He was an outstanding teacher of chemistry and deeply consecrated to the development of race leadership in chemistry and bringing about needed improvements in the teaching of chemistry. He inspired many of the Negro race to go into the field of chemistry.

LLOYD A. HALL

1894 -

Hall has made his notable contributions in the field of food chemistry. His researches include foods, oils and fats, protein hydrolysates, antioxidants and pharmaceuticals.

As Consulting Chemist to the Griffith Laboratories in Chicago, in the field of Industrial Chemistry, he rose rapidly to the position of Director of Research. Hall holds over eighty patents related to the preparation and curing of salts, spices and food products. He opened a new field in this area and his advice was sought by major agencies of the United States Government connected with the problems of maintaining our food supplies in a pure and palatable form. He has won many honors in his field.

Dr. Hall is now retired and lives in California. He was a close friend of Dr. Richard Drew, of blood bank fame, and still corresponds with Drew's widow in Washington, D.C.

ROBERT PERCY BARNES

1898 -

Dr. Barnes is one of America's outstanding Organic Chemists. Born in Washington, D. C. in 1898, he took his Bachelor's degree at Amherst College where he was elected to the honorary society Phi Beta Kappa in his senior year. He was appointed as Assistant in Chemistry at Amherst.

He took his graduate work in Chemistry at Howard University where he became a brilliant student in organic chemistry. In 1930 he secured the M.A. degree and in 1933 the Ph.D. degree. He had done extensive work on diketones, an important aspect of organic chemistry.

Barnes was the author and co-author of more than twenty research papers in leading scientific journals. His contributions to the field of organic chemistry can be gleaned from the following important research papers authored by him:

1. The Tautomerism of Alpha Diketones, Journal of the American Chemical Society, vol. 56, 1934, p. 211
2. The Action of Alkali on Certain Acylated Ketoximes, Journal of the American Chemical Society, vol. 57, 1935, p. 1330
3. Steric hindrance in Alpha Diketones, Journal of the American Society, vol. 57, 1935, p. 937
4. Properties of O-Bromo-phenylbenzylgly-oxalmethylation of Alpha Diketones, Journal of the American Chemical Society, vol. 58, 1936, p. 1300

PERCY LAVON JULIAN

1898 -

If one were to ask which scientist - Negro or white - has contributed most to the field or Organic Chemistry, the answer would certainly have to include Dr. Percy L. Julian.

Born in Montgomery, Alabama in 1898, where his father was a railway mail clerk, Julian went through elementary and high school there. As a student at DePauw University in 1916 he became interested in chemistry and pursued it as his area of specialization. When he graduated in 1920, he was elected to Phi Beta Kappa and was the valedictorian of his class.

During the next four years at Harvard University, he obtained the M. S. degree in organic chemistry. From there he went to the University of Vienna in Austria where he worked under Ernest Spath, the chemist who synthesized nicotine, and in 1931 received his doctorate degree in Chemistry. While in Austria, Julian became interested in the soybean which had been imported into Germany for the manufacture of certain drugs, among them physostigmine. The structure of physostigmine was not known at that time, nor why it caused the pupil of the eye to contract.

Prior to his going to Austria, Julian had served as Instructor in Chemistry at Fisk University from 1920 to 1922. After finishing his work at Harvard University, he was given the position of Research Assistant there for the year 1925 to 1926. From 1927 to 1929 he was Associate Professor and Acting Head of the department of Chemistry at Howard University.

When he returned to the United States from Austria, Julian became Research Professor at De Pauw where he stayed from 1932 to 1936. Here he carried on work on the structure and synthesis of physostigmine and after considerable research presented two papers before the American Chemical Society announcing the precursors of physostigmine. In 1935 he succeeded in synthesizing the drug physostigmine.

From his work with the soybean, he was able to extract cortisone and other drugs. Formerly sterols like cortisone were extracted from animal bile at a cost of several hundred dollars per gram. Julian extracted these sterols from soy bean oil at the cost of only 20¢ per gram thereby bringing the drug within the reach of millions of arthritis sufferers.

During Julian's tenure at De Pauw University, his scientific work almost came to an impasse. De Pauw did not continue to finance Julian's research work even though it had won the acclaim of American and European scientists. Julian was so disillusioned that he says he was "almost ready to accept the early verdict of his professors that there was no future for a Negro scientist - and start making an honest living driving a truck". At this point the Rosenwald Fund stepped in with fellowship grants to support his work for two years. These awards gave him fresh confidence and enabled him to complete his researches and publish findings that were hailed as "the only research in pure chemistry of unquestionable merit which has so far ever been achieved by a Negro". Dr. Julian insists that help from the fund came at just the time to lift him over deep discouragement and to keep him driving on in science.

After serving on the staffs of both white and Negro universities, Julian resigned to become Director of Research for the Glidden Chemical Company in Chicago. His task was to work out a new process for isolating and preparing commercially soybean protein which was widely used in the sizing and coating of paper in cold-water paints and textile sizing. Julian's appointment as Chief Chemist and Director of Research for the Glidden Company is regarded as a turning point in the treatment of Negro scientists. It was the first time a Negro had the opportunity to direct a modern industrial laboratory employing a number of chemists of other races. Soon after this, other Negroes were appointed to important positions in various scientific fields.

Julian's new processes and work with the Glidden Company caused that company to go in one year from a loss of $35,000 to a profit of $135,000. His patents there deal with the isolation of pure protein from oleagenous seeds (soy bean) with the preparation of plastic materials, the preparation of cold-water paints, and the isolation of sterols from soybean oil from which sex hormones are readily processed. From the soybean he found a protein which both coats paper and snuffs out gasoline fires; from sterols previously unobtainable in commercial quantities, he brought progesterone within the reach of all expectant mothers threatened with loss of their unborn babies, and testerone to the potent aid of older men. He stayed with the Glidden Company from 1936 until 1953. In 1953 he founded the Julian Laboratories in Franklin Park, Illinois. During the first year his laboratory showed a net profit of $71.70, but the next profit at the end of the second year was $97,000. In 1961 the Julian Laboratories merged with the giant Smith, Kline and French Pharmaceutical Company and Dr. Julian received several million dollars as a result.

At the present time, Dr. Julian is still engaged in basic research especially with regard to the sex hormones and birth control. When I spoke to Dr. Julian about one month ago, he made the characteristic remark, "There is so much that I still have to do." He no doubt was referring to the fact that at age 68 he did not have as much time to do all the research that he felt still had to be done. So typical of a real scientist!

He now lives in Oak Park, Illinois, a prosperous suburb of Chicago. It is ironical that his charming home was stoned several times simply because he is one of the few Negroes who lives in that predominantly white area. His two brothers are physicians and his three sisters all have their Master's degrees. His wife, Anna, whom he married in 1935 holds a doctor's degree in sociology.

Julian recently said to an interviewer, "I have become much too interested in the chemistry of human health ever to go back to paints and varnishes".

IV. PHYSICIANS

This final section will deal with the contributions of the Negro scientist to the field of Medicine. It is of interest to note that some of the greatest contributions of Negroes have been in the fields of Chemistry and Medicine. It may have started with James Derham who was born a slave in 1762 in Philadelphia and who became the first Negro physician in America. It may also stem from the fact that Negro physicians were up against so many odds that the incentive to excel was very great.

In this section, the following physicians and their contributions will be listed:

Daniel H. Williams	1858 - 1931
Ulysses G. Dailey	1885 - 1961
Louis T. Wright	1891 - 1952
Theodore K. Lawless	1892 -
Richard R. Drew	1904 - 1950

DANIEL HALE WILLIAMS

1858 - 1931

In this day and age of successful heart surgery, how many people know that the first successful surgery ever done on the human heart was performed on July 10, 1893 by a Negro physician named Daniel Hale Williams?

On both his father's and mother's side, Williams came from at least three generations of freely and legally intermarrying whites, Indians and Negroes who were well educated for their times, and industrious, property-owning people of substance. His paternal grandfather had extensive property in the town of Holidaysburg, Pennsylvania where Williams was born in 1858. His father was a highly articulate barber who travelled widely as a lecturer for the abolitionist Equal Rights League.

Daniel spent a happy childhood with his brother and five sisters. After graduating from high school (Hare's Classical Academy in Janesville, Wisconsin), he entered a law office in Janesville to become a lawyer. However he soon evinced an interest in science. Aided by a friend of the family, Mr. Charles Anderson, Dr. Henry Palmer, the Surgeon-General of Janesville, allowed the boy to study medicine in his office. After two years of study, Daniel passed the entrance examinations and was admitted to the Chicago Medical College (later the Northwestern University School of Medicine).

During his summers at medical school, Williams earned his tuition by playing in orchestras on excursion boats on Lake Michigan. In 1883, he graduated from medical school as an outstanding student and was invited to stay on as instructor in anatomy. This was very unusual for a Negro student. Although Negro doctors and nurses were not admitted to the Chicago hospitals at that time, Williams performed as a surgeon at the Southside Dispensary in Chicago and at the Protestant Orphan Asylum. He was invited to become a member of the Illinois State Board of Health.

Being interested in better hospital facilities for Negroes, he called a meeting of interested citizens - Negro and white - and succeeded in founding the Provident Hospital and Training School for Nurses in 1891. Because of this, he is often referred to as the "Father of Negro Hospitals". It was at the Provident Hospital that Williams performed the first successful operation on a human heart. The patient, a man by the name of Cornish, had been stabbed into the heart and there was apparently no hope for him. Williams proceeded to sew up the cut in the man's heart and Cornish lived for many years after that. This had never been done before!

In the National Archives in Washington, D. C. this researcher came across some very interesting letters and documents dealing with Williams' application for the position of Surgeon-General of Freedmen's Hospital in Washington, D.C. While there were several letters recommending his appointment, there were a few (like Travis Glascoe) who opposed his appointment on mostly political grounds. However, in 1893, he was appointed to the post and stayed there for five years. While there he again instituted a training school for Negro nurses as part of the Freedmen's Hospital's program. Unfortunately, his political foes caused his resignation on February 1, 1898 at which time he returned to Chicago.

In Chicago he returned to private practice. Once a year he held demonstrations in the surgical clinic at Meharry Medical College in Nashville, attended by young doctors from many states who came to watch his operations. He was a superb surgeon. In the early 1900's he became a member of the surgical staff of Cook County Hospital, one of the largest hospitals in Illinois. Later he was to become associate surgeon at Chicago's famous St. Luke's Hospital. In 1913 Williams received the exceptional honor of being made Fellow of the American College of Surgeons.

He was one of the founders of the National Medical Association, an organization similar to the American Medical Association but composed almost exclusively of Negro doctors. He helped in later years to build hospitals and training schools for Negroes in many cities such as Atlanta, Dallas, Nashville and Louisville.

Dr. Williams died in 1931 at the age of 73 after a long and successful life as a physician and surgeon.

ULYSSES GRANT DAILEY

1885 - 1961

Dr. Dailey contributed greatly to medicine and surgery in the fields of jaundice, thyroid diseases, and diseases of the gastero-intestinal and biliary tracts. For his outstanding work in these areas, he received the Distinguished Service Award for 1949 from the National Medical Association.

Born on August 3, 1885, in Donaldsonville, Louisiana, he attended high school in Ft. Worth, Texas and then the Straight College in New Orleans, Louisiana. At the age of 21 he graduated from Northwestern University Medical School, the youngest member of his class. He ranked among the first five in the class in scholarship. For two years after graduation he served as Assistant Demonstrator of Anatomy at Northwestern Medical School.

In 1907 he was appointed Ambulance Surgeon for the Chicago Department of Health (a civil service job) and held this post for three years. From 1909 to 1917 he was the Gynecologist at the Provident Hospital Dispensary, and Instructor of Anatomy and Physiology at the Provident Hospital Training School. During the latter part, from 1916 to 1917 he also served as Instructor in Experimental Surgery at the Chicago Medical School. In 1932 he was appointed Senior Attending Surgeon at the Provident Hospital, then on to Senior Consulting Surgeon at that hospital. He had also served as assistant to the now famous Dr. Daniel H. Williams.

It was during these years that Dr. Dailey made most of his contributions to medicine and surgery referred to on the previous page.

In 1912 Dailey went to Paris and Berlin to undertake postgraduate study in surgery and profited a good deal thereby. Later on, in 1925, his medical travels took him to London, Paris, Vienna and Rome where his work was respected and admired. In 1926 he established the Dailey Hospital and Sanatorium.

Dailey was a diplomate of the American Board of Surgery and a Fellow of the American Medical Association and the International College of Surgeons. He received the honorary degree of D. Sc. from Howard University in 1947.

LOUIS T. WRIGHT

1891 - 1952

Dr. Wright has made outstanding contributions in the field of surgical and medical research. He conducted the first successful experiments on human beings with the then newly discovered antibiotic, aureomycin.

Wright was born in Georgia where he received his early education. He then attended Clark University in Atlanta where his mother was a teacher. His father died when he was four years old, and eight years later his mother married Dr. W. S. Penn of Atlanta, a surgeon at the Negro Veteran's Hospital at Tuskegee. Dr. Penn inspired Louis to study medicine, and at the age of twenty he entered Harvard Medical College.

His four years at Harvard were spent in hard study and Wright graduated fourth in a class of over a hundred students. After graduation he took his interneship at the Freedmen's Hospital in Washington, D. C. where Dr. Walter Van Sweringe speaks of him in highest praise. After his internship, Wright took medical examinations in three states, making record marks. In Maryland, he had the highest mark (94%) of the fifty three men examined, ten of them graduates of the famous Johns Hopkins Medical School. In Georgia, he passed with the highest mark (95.7%) made by anyone that year and one of the highest marks ever made in that state. And in New York, he stood at 92.4%. He had a brilliant mind and a retentive memory. At medical school he won a scholarship each year.

He had been practicing a short time with his step-father, Dr. Penn, when World War I started. Before long he was in the officers training camp at Des Moines and then a lieutenant at Camp Upton. It was at Camp Upton that Dr. Wright made his first ard most important contribution to the medical world.

Dr. Wright experimented with an intradermal or intracutaneous method for injections, not unlike the Schick test for diphtheria. He diluted the vaccine virus with a normal saline solution and injected about 0.1 cc into, not through, the skin. This proved to be a far superior method and prevented many complications that could have led to fatalities due to anaphylactic shock from hypersensitivity. Dr. Wright's method was widely used by the army, and he was considered an authority on the subject. It was, in fact, a new method of vaccination that was tested and used by the United States Government.

It was later on that Wright conducted the first successful experiments on human beings with the antibiotic, aureomycin. He experimented with aureomycin in an attempt to find a cure for lymphogranuloma venereum (a veneral disease) on which he was an authority. He was highly successful in his efforts.[8]

Wright was the Director of Surgery at the Harlem Hospital in New York City and Police Surgeon for the City of New York. He was the co-author of a textbook on surgery. The NAACP awarded him the Spingarn Medal for his contributions to the healing of mankind. Today, the medical library in Harlem Hospital is called the "Louis T. Wright Library".

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[8] Wright, L. T., et al, Aureomycin: A New Antibiotic With Viricidal Properties. A Preliminary Report on Successful Treatment in 25 Cases of Lymphogranuloma Venereum, Journal of American Medical Association, 38:408-412, 1948

THEODORE K. LAWLESS

1892 -

Dr. Lawless is one of the world's leading dermatologists or skin specialists. He has made outstanding contributions to the scientific treatment of syphilis and leprosy. He won the Spingarn Medal for his extensive research and experiments in the field of dermatology, NAACP, 1954.

Lawless was born in Thibodeaux, Louisiana in 1892. After his elementary and high school education, he attended the Talladega College in Alabama and the University of Kansas. He received his M.S. and M.D. degrees from Northwestern University where he was an Elizabeth J. Ward Fellow in Dermatology. After graduation, he devoted his time to teaching in the Department of Dermatology and Syphilology. It was here that he made most of his contributions to the scientific treatment of syphilis and leprosy.

Later on he became Consultant and Lecturer at the Provident Hospital in Chicago. Today Dr. Lawless maintains his own laboratories in Chicago which is open to all doctors in the city of Chicago.

Dr. Lawless has carried on further study in dermatology in such European countries as Paris, France; Austria; Switzerland; and Germany. He contributed the sum of $500,000 toward the opening of the "Lawless Dermatology Clinic" in the Beilinson Hospital Center in Israel.

Besides receiving the Spingarn Medal, he received the Harmon Award in 1929 for outstanding achievement in medicine.

CHARLES RICHARD DREW

1904 - 1950

Who is to say how many lives have been saved through the pioneering and outstanding work of that genius, Dr. Charles R. Drew? He, it was who organized the blood banks for both England and the United States during World War II. Yet, in looking through many high school and college texts, I have as yet been unable to discover one wherein the work of Drew is mentioned when the work of blood banks is described!

Drew was born in Washington, D. C. on June 3, 1904. He was the eldest of five children. His father was a carpet layer and the family lived in modest circumstances and highly respected. Young Drew attended public schools in Washington graduating from Stevens Elementary School in 1918 and from Dunbar High School in 1922.

Drew's prowess in athletics manifested itself at an early age when he won a swimming tournament at the age of 8. At high school he starred in football, basketball, baseball and track. There he won the James E. Walker Memorial Medal for all-around athlete. At Amherst College, which he entered in 1922, he got his letters in football and track. In 1924 he was mentioned as All-American halfback in football. He was also captain of the varsity track team, and at graduation was awarded the Mossman Trophy as the student who brought the most honors to Amherst during his four years there. After college, Drew needed money and took a position at Morgan State College as Athletic Coach where he developed record-breaking teams.

At this time, Drew decided to go to medical school and he first applied to the Howard University School of Medicine. He was refused admission because he had only six of the required eight hours of English. He was accepted at McGill University Medical School in Montreal, Canada where he turned out to be an outstanding student. He won the annual prize in neuroanatomy, was elected to Alpha Omega Alpha, the medical honorary scholastic fraternity, and won the Williams Prize in his senior year on the basis of a competitive examination given to the top five men in the graduating class.

It was at this time that Drew ran into difficulty. His money at McGill Medical School ran out with only one more year to go, and it began to look as if he would not be able to finish his medical education. Just then, he received a Rosenwald Fellowship from the Rosenwald Foundation Fund which enabled him to complete his medical education and finish second in a class of 137 students.

From McGill, Drew went to Howard University Medical School as an Instructor in Pathology. He went on to become Instructor in Surgery and Assistant Surgeon at the Freedmen's Hospital. As the result of a fellowship from the General Education Board, Drew spent two years (1938 to 1940) in graduate study at Columbia University and as resident in surgery in the Presbyterian Hospital. There he worked under Dr. John Scudder. Scudder's team was engaged in studies relating to fluid balance, blood chemistry and blood transfusion. Drew's special province became the study of blood preservation. His doctoral thesis was "Banked Blood" and Drew became an authority on the subject. When World War II came, Drew was perfectly prepared and equipped in this area. In 1929 the Blood Transfusion Association was organized to improve the supply of blood for transfusion purposes in New York City. It financed research programs, and financed one in the Presbyterian Hospital by Dr. Scudder and Dr. Drew in 1940. By that time, the military situation in England grew worse. Drew received a cablegram from Dr. John Beattie (his teacher of anatomy at McGill),who was then the Director of Research Laboratories of the Royal College of Surgeons, asking for dried plasma for transfusion work. As a result the "Blood For Britain" project was swiftly organized and Drew was chosen by the Board of Medical Control as the "best qualified of anyone we know to act in this important development".

In February, 1941 Drew was appointed Director of the first American Red Cross Blood Bank at the Presbyterian Hospital, and Assistant Director of Blood Procurement for the National Research Council, in charge of blood for use by the United States Army and Navy. It was ironic that Drew was forced to separate Negro and white blood in the blood banks that he set up even though it is well known by scientists that there is no difference between the two bloods.

In May, 1941 Drew returned to Howard University as an Assistant in Surgery and then was elevated to full professorship and head of the department of surgery in July of that year. He was also made Chief of Staff at Freedmen's Hospital. In April, 1942 he was made an Examiner by the American Board of Surgery, a great distinction, and was given the E. S. Jones Award for Research in Medical Science. In 1944, he received the Spingarn Medal from the NAACP for his blood plasma work.

Many other awards came to Drew that are too numerous to mention here. In 1946, he was elected Fellow of the International College of Surgeons, and in 1949 he was made Surgical Consultant to the U. S. Army's Surgeon General where he was a member of a team of four physicians who toured hospital installations in occupied Europe to improve the quality of these hospitals.

In April, 1950 Drew was scheduled to go to a medical meeting at the Tuskegee Institute in Alabama. He was going to go by train but the three other young doctors who were to go with him could not afford the train fare so Drew drove them down. While driving, late at night, Drew was so tired that he dozed off. The auto turned over and Drew was killed. The other three doctors were not hurt.

On July 6, 1966 I was fortunate enough to secure an interview with Dr. Drew's widow who now resides in Washington. Mrs. Drew wanted me to stress his powerful personality and the profound influence that he had on others. She said that he spent a lot of time and effort on training his residents in surgery at Freedmen's Hospital and set up an excellent program for training surgery residents. She pointed out that a number of schools have been named after her husband, as well as a medical center in California, and the men's dormitory at the Howard University.

It would be of interest to complete this report with some data regarding Negro professionals. The following table shows the earned doctorates from 1920 to 1962:[9]

Area	Negro and White	Negro alone	% of Negro
Physics & Astronomy	9,618	17	0.17
Chemistry	23,697	98	0.41
Earth Science	3,743	2	0.02
Engineering	10,209	3	0.03
Agriculture	5,122	53	0.29
Medical sciences	1,775	13	0.73
Biological sciences	31,829	184	0.57

It would seem, from these figures, that the fields that attract Negroes are Chemistry, the biological and the medical sciences. In fact it is in these fields that the Negro has made his greatest contributions.

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